

THURSDAY, AUGUST, 26, 1880

DR. BASTIAN ON THE BRAIN

The Brain as an Organ of Mind. By H. Charlton Bastian, M.A., M.D., F.R.S. International Scientific Series. (London: Kegan Paul and Co., 1880.)

WITHOUT preface or other proposition than that suggested by the title of his book, Dr. Bastian commences to deal with his subject by an inquiry into the Uses and Origin and the Structure of a Nervous System. His motive, as expressed farther on, in giving such a wide scope to himself in his method of exposition was to ascertain whether the general similarity in structure of the nervous system in the lower animals as compared with that of man, "carried with it a general similarity in mode of action." To all those who, like Dr. Bastian, look upon mental phenomena from the evolutionary aspect—aiming as they do at reducing psychology to a more or less transcendental branch of physiology—this, if not a necessary, seems at least to be a favourite plan. Such readers as require to be initiated into the earliest mysteries of zoology and physiology must find this method a useful one, inasmuch as by submitting themselves to the guidance of an accomplished and trustworthy guide such as Dr. Bastian, they are led with ease and interest through a field of attractive information to the consideration of the main problem which the author keeps continually in view. To the author himself, however, the method is one which is not free from disadvantages. It leads him, for instance, at the very beginning of his task into the most hypothetical region of evolutionism, namely, that which has to do with the commencement of divergences from the homogeneous to the heterogeneous in structure and function; and so affords to sceptics and even to others who may have a stronger predisposition to accept his views, an opportunity of assigning to his argument a weakness which is inherent not in the argument itself but in the present state of a rapidly-progressing branch of science, of which he has submitted a sketch for the guidance of his readers. When Dr. Bastian, for instance, discusses the method in which muscular tissue may be produced by recurring contractions, his language is necessarily so hypothetical that his readers may incline to think that a work which commences in such a nebulous form can scarcely end in the satisfactory exposition of a new philosophy. It is a pity that false conclusions should be suggested by sentences which have no direct or essential connection with the author's argument.

When, however, Dr. Bastian has disposed of the preliminary parts of his work he enters with emphasis into the statement of his views regarding the Scope of Mind. He considers it a "legitimate inference" that the term "Mind" no more corresponds to a definite self-existing principle than the word 'Magnetism.'" He repeats the demonstration of the fallacy which pervades every region of introspective metaphysics (H) that, namely, of regarding all mental phenomena as being limited or bounded by the sphere of consciousness; and, with admirable clearness, expands into a definition the title of his work.

"In treating of 'The Brain as an Organ of Mind,'" he says "it will be understood that we use the word 'organ' merely in the sense that it is a part whose molecular

changes and activities constitute the essential *correlatives* (the italics are ours) of those phases of Consciousness known as Sensations, Emotions, Thoughts, and Volitions, as well as of a considerable part of the sum total of those other related nerve actions which are unattended by Consciousness, and whose results form, in accordance with the views above stated, so large a proportion of the phenomena comprehended under the general abstract word 'Mind.'"

This sentence expresses admirably the position which has been arrived at by all who have studied psychology from the biological point of view, and it is difficult to understand how such a moderate statement of the relationship of Mind to Brain should require in Dr. Bastian's and other recent books to be supported by an imposing presentation of facts relating to the comparative anatomy and physiology of the nervous system.

Dr. Bastian's volume is a valuable and opportune addition to the International Scientific Series. It will supply a want which has been much felt by specialists as well as by general readers who have been desirous of obtaining a knowledge of the opinions held by exponents of this line of thought—a class of writers whose style is apt to be obscure, and whose writings are too frequently contained in scattered and unattainable periodicals. The writer of this work deserves to be complimented on the success with which he has propounded his own special views regarding brain functions without assigning to them such an undue predominance as to rob his work of the credit of being a fair and comprehensive statement of what has been discovered and believed by other workers in the same field. Dr. Bastian writes in all departments of his subject with that ease and clearness which are indicative of perfect knowledge. If in anything this statement does not hold good the exception could be made only with regard to an apparent tendency to do some little injustice to the views of Hughlings-Jackson by attaching a meaning to some of his terms which is too bald and mechanical. Dr. Bastian himself excludes the processes taking place in the Motor Centres of the Cerebrum from "the cerebral substrata of Mind," and he cannot consequently be expected to lavish much sympathy on doctrines of an opposite tendency.

"The Cerebral substrata of Mind," he says, "in no way include, as the writer believes, the processes taking place in the Motor Centres of the Cerebrum wheresoever they may be situated. Mental operations, in other words, can no longer be legitimately postulated as being in part immediately due to the activity of Motor Centres. Nor can 'ideal' words be rightly described as 'motor processes.' This is a point so fundamental that in regard to it there should be no misunderstandings or ambiguities other than those which may be inherent in the subject itself."

Similarly the author speaks of "Mind as comprising the results of all nerve actions, other than those of outgoing currents." To us this exclusion of the motor element from the constitution of mind and the range of mental phenomena appears somewhat arbitrary, and, from an evolutionary point of view, unnatural; but the opponents of Dr. Bastian's views will prefer to fight their own battle, and the question is one which as yet has not been sufficiently discussed to justify a critical judgment.

S

VOL. XXII.—No. 565

Some of the last chapters of this excellent work are specially rich in information and suggestiveness. That on "Will and Voluntary Movements" deals lucidly with a difficult subject; and the chapters on "Speaking, Reading, and Writing," and on "The Cerebral Relations of Speech and Thought" contain much valuable information regarding the physiology and pathology of intellectual expression and the light which they throw upon the nature of mind as a function of the brain—a phrase which must be read subject to the explanation which Dr. Bastian gives of the title of his work. There may be some reason to doubt whether transcendental metaphysicians will be prepared to admit that their belief in mind as an entity has been so completely destroyed, as Dr. Bastian thinks, by the demonstration of the doctrine of unconscious cerebration and the consequent vitiation of all deductions drawn exclusively from within the range of consciousness; but there is no room for doubt that metaphysicians of all shades must make themselves familiar with such researches as those embodied in Dr. Bastian's work. Should they fail to do so they must be prepared to find their carefully-nurtured speculations exposed to many severe rebuffs, and open at all times to that kind of merciless danger which theories experience when they run against conflicting facts.

This work is the best book of its kind. It is full, and at the same time concise; comprehensive, but confined to a readable limit; and though it deals with many subtle subjects it expounds them in a style which is admirable for its clearness and simplicity.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

Eozoic and Palæozoic

PERMIT an old worker in fossils to protest mildly against the slapdash manner in which writers sometimes hit off great palæontological questions. In your review of Roemer's valuable "Lethæa Palæozoica" it is stated that in regard to *Eozoön canadense*, he "accepts the verdict of Möbius against its organic origin, and rejects it from the list of palæozoic fossils." Now as to the acceptance of the "verdict" in question, I have nothing to say, except that the naturalist to whom are assigned the functions of judge and jury in the case very obviously lacks some of the qualifications for that high office, and has not been recognised by those best qualified to understand the case of *Eozoön*. But why Roemer or your reviewer should "reject *Eozoön* from the list of palæozoic fossils" I am at a loss to understand. As a writer on palæozoic fossils, Roemer has nothing to do with *Eozoön*. It belongs to that great series of eozoic or archæan formations which precedes the palæozoic, and which probably represents quite as long a period. Little comparatively is known of the fossils of these oldest rocks; but what we do know of their *Eozoön*, *Archæospherina*, *Spiral arenicolites*, and *Aspidella*, and of their immense deposits of graphitised plants, is sufficient to assure us that the life of the eozoic period was very different from that of the palæozoic; *Eozoön*, whatever its nature, is one of the most characteristic of these eozoic fossils. It has been recognised through a great vertical thickness of beds, and over so wide areas, that it is now equally characteristic of eozoic rocks in Canada and Brazil, in Bavaria and in Scandinavia. Further, it has obviously been connected with the accumulation of some of the greatest limestones of the eozoic time.

One can excuse a palæontologist familiar only with mesozoic or kainozoic fossils, when he doubts as to the organic nature of such obscure markings as *Oldhamia*, or even as to those wrinklings and scratchings on Cambrian slates which are recognised as trilobites and sponges; but we never think of asking him to accept or reject them as mesozoic fossils. In like manner those who are working out the dim traces of life remaining in the eozoic rocks will be content if geologists who scarcely condescend to recognise these great formations in their arrangements will abstain in the mean time from pronouncing judgment on eozoic remains supposed to be organic.

To us in Canada who have long regarded the eozoic formations as being quite as important in a physical point of view as the palæozoic, it is a matter of congratulation that they are now attracting so much of the attention of British geologists. Their palæontology, it is true, is still meagre, but our knowledge of it is gradually increasing, and those who have lived to see the Cambrian fauna grow from nothing to its present satisfactory condition need not despair of the Laurentian or Huronian.

Montreal, August 5

J. W. DAWSON

Algæ

I NOTICE in NATURE, vol. xxii. p. 319, that amongst other subjects you answer inquiries about minute "algæ."

I venture to send you herewith specimens of one of the Oscillatoriaceæ, which I believe is rare. In form it is nearest to what is described in the "Micrographical Dictionary" as "*Spirulina oscillarioides*" (Turp.?), but it is very much larger. When two join and intertwine they form a cable. Under an 1st objective it is a most striking object; it has the characteristic deep blue-green colour, and also its movements.

I shall be glad to know if it has been described by any one.

G. F. CHANTRELL

St. James's Mount, Liverpool, August 6

[The alga is *Spirulina jenneri*, Kütz., and the *Spirillum jenneri*, Hassall. It is described in the "Fresh Water Algæ" of the latter author, and the description occurs also in Rabenhorst's "Algæ aquæ-dulcis."]

During this year, in a paper read by the Rev. J. E. Vize at the Montgomery Society, and printed in their *Proceedings*, it is called *Spirulina oscillarioides*, but it is larger, and more distinctly articulated than that species. The figure given by Mr. Vize is accurate. It is not very common, but we have heard of it in two or three localities during the past twelve months.—ED.]

Lightning Conductors

I SHALL feel exceedingly obliged if you will have the kindness to reply to the following question:—The painter of my villa (Villa Calpe) having taken the liberty to paint the chain of the lightning conductor attached to my house, I should like to know whether it will interfere with the efficiency of the apparatus.

CATHERINE MCPHERSON DE BREMON

Biarritz, August 5

[A coat of paint on a lightning conductor will not at all affect its efficiency. It will protect it from rust, which of course is an advantage. But if the note is to be read literally and a chain is used as a conductor, it is the worst possible form, and it ought to be changed for a continuous conductor. The links of a chain only touch each other at points, so that even a link made of half an inch in diameter of metal is reduced to the size of less than $\frac{1}{16}$ of an inch of metal. We would rather trust to a copper wire of $\frac{1}{8}$ than to a link of much larger size. A point of great importance is to have a good discharge in the earth, either wet soil or a large quantity of metal joined to the conductor.—ED.]

Strange Method of Crossing a Torrent

REFERRING to the inquiry of your correspondent as to the existence in modern times of the practice of carrying a stone to steady oneself whilst crossing a torrent, I may state that it is well known to the inhabitants of mountainous districts, and though practically it may not often have to be resorted to in Switzerland, where the streams are mostly well bridged, I have myself been glad to adopt it in Dauphiné. As, however, a weight on the head or shoulders would, by raising the centre of gravity, rather diminish than add to the steadiness of the bearer, it is more usual to fill the lower side pockets of the coat, and per-